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Constellation Energy
Generation Group

May 14, 2007

U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: **R.E. Ginna Nuclear Power Plant**
Docket No. 50-244

LER 2007-002, Closure of Main Steam Isolation Valve Results in Safety Injection Signal and Plant Trip

The attached Licensee Event Report (LER) 2007-002 is submitted in accordance with 10 CFR 50.73, Licensee Event Report System. There are no new commitments contained in this submittal. Should you have questions regarding the information in this submittal, please contact Mr. Robert Randall at (585) 771-5219 or robert.randall@constellation.com.

Very truly yours,

Mary G. Korsnick

Mary G. Korsnick

Attachments: (1) LER 2007-002

cc: S. J. Collins, NRC
D. V. Pickett, NRC
Resident Inspector, NRC (Ginna)

IE22

1001790

Attachment 1

LER 2007-002

Closure of Main Steam Isolation Valve
Results in Safety Injection Signal and Plant Trip

NRC FORM 366 (6-2004)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OMB: NO. 3150-0104 EXPIRES: 06/30/2007

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
R.E. Ginna Nuclear Power Plant	05000 244	1 OF 6

4. TITLE
Closure of Main Steam Isolation Valve Results in Safety Injection Signal and Plant Trip

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER 05000
03	16	2007	2007	- 002 -	00	5	14	2007	FACILITY NAME	DOCKET NUMBER 05000

9. OPERATING MODE: 1

10. POWER LEVEL: 100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
Robert Randall, Director of Licensing	(585) 771-5219

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
D	SB	ISV	A585	Y					

14. SUPPLEMENTAL REPORT EXPECTED		15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)*	☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On March 16, 2007, at approximately 2209 EST, with the plant in Mode 1, initially at 100% steady state reactor power, an event occurred resulting in a safety injection signal and an automatic reactor trip. The Control Room operators performed the appropriate actions of procedures E-0 and ES-1.1. Following the reactor trip, all safety systems operated as designed. The reactor was stabilized in Mode 3.

The safety injection signal and subsequent reactor trip resulted from the 'B' Main Steam Isolation Valve (MSIV) unexpectedly closing and a low steam line pressure condition occurring when the 'A' Steam Generator attempted to handle the full steam load requirements at the time. The cause of this event was a lack of configuration control associated with the actuator for the 'B' MSIV.

Corrective action to prevent recurrence is outlined in Section V.B.

17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

I. PRE-EVENT PLANT CONDITIONS:

On March 16, 2007 the R.E. Ginna Nuclear Power Plant (Ginna) was in Mode 1 at approximately 100% steady state reactor power.

II. DESCRIPTION OF EVENT:

A. EVENT:

On March 16, 2007, at approximately 2209 EST, Ginna experienced a safety injection signal and reactor trip as the result of low steam pressure in the 'A' main steam line. The event was the result of the 'B' Main Steam Isolation Valve (MSIV) closing due to a change in the pressure balance in the actuator that keeps the valve disk out of the main steam flow path. The closure of the 'B' MSIV caused steam flow isolation from the 'B' Steam Generator. This in turn caused steam flow from 'A' Steam Generator to rapidly increase in an attempt to maintain the required full power steam flow to the High Pressure Turbine. The increase in steam flow from the 'A' Steam Generator caused a rapid decrease in 'A' steam line pressure which generated a low 'A' steam line pressure safety injection signal. The safety injection signal caused the reactor to trip, as is required by design.

The Control Room operators performed the appropriate actions of Emergency Operating Procedure E-0 (Reactor Trip or Safety Injection). The operators then transitioned to Emergency Operating Procedure ES-1.1 (SI Termination) when directed by procedure E-0.

B. INOPERABLE STRUCTURES, COMPONENTS, OR SYSTEMS THAT CONTRIBUTED TO THE EVENT:

None

C. DATES AND APPROXIMATE TIMES OF MAJOR OCCURENCES:

- March 16, 2007, 2209 EST: automatic safety injection signal and reactor trip due to low steam pressure from the 'A' Steam Generator.

D. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

None

17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

E. METHOD OF DISCOVERY:

The safety injection signal and reactor trip were immediately apparent due to plant response, alarms, and indications in the Control Room.

F. SAFETY SYSTEM RESPONSES:

The required automatic system responses resulting from the safety injection signal were confirmed to have occurred. No injection to the reactor coolant system was required due to the system pressure. Additionally, actuation of the Turbine Driven Auxiliary Feedwater Pump occurred due to the coincident low water levels in both steam generators.

Immediately following receipt of the safety injection signal, the high flow from 'A' Steam generator in combination with the safety injection signal caused a Main Steam Isolation of the 'A' MSIV. The resulting closure of the 'A' MSIV caused the main condenser dump valves to not be available for controlling steam generator pressure for both steam generators. Steaming of both steam generators was provided by operation of the Atmospheric Relief Valves (ARVs). The peak pressure in the 'B' main steam line approached the nominal setpoint of Main Steam Safety Valve (MSSV) 3514. No MSSV actuations were apparent based on a review of computer data. Proper operation of the ARVs was able to control steam generator pressure for both steam generators.

III. CAUSE OF EVENT:

The immediate cause of the reactor trip was an automatic safety injection signal which actuated as the result of low steam pressure in the steam line from the 'A' Steam Generator. The low 'A' steam line pressure was an indirect result of the spurious closure of the 'B' MSIV.

The cause of this event was a lack of procedural guidance and maintenance practices, in conjunction with a lack of configuration control, which failed to identify that a solid plug was installed in the 'B' MSIV actuator exhaust vent port instead of a drilled plug. The solid plug prevented instrument air that leaked past the actuator piston seals from venting to the atmosphere. The seal leakage that accumulated in the upper chamber of the actuator over time, built up to equalize the pressure between the two sides of the piston, and allowed the spring force to overcome the instrument air pressure. This resulted in the valve disc moving into the flow stream, closing the valve.

The requirement to have a drilled plug instead of a solid plug was a preventative action that was implemented following MSIV closures in 1975. This information was not properly placed in the applicable drawings and procedures at that time. The 'B' MSIV actuator had recently been replaced in the fall 2006 refueling outage. Prior to the fall 2006 refueling outage the actuator was normally rebuilt and reinstalled. Several key steps to accurately complete the

17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

refurbishment of the MSIV actuator were missing from the maintenance procedure and these activities were completed using knowledge based maintenance and skill of the craft work practices.

IV. ASSESSMENT OF THE SAFETY CONSEQUENCES OF THE EVENT:

This event is reportable in accordance with 10 CFR 50.73, Licensee Event Report System, item (a)(2) (iv)(A), which requires a report of, "Any event or condition that resulted in a manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section". The automatic safety injection signal resulted in the automatic reactor trip actuation and the starting of numerous safeguards components. Additional reportable automatic actuations include the closure of the opposite MSIV as the result of the Main Steam Isolation signal and the starting of the Turbine Driven Auxiliary Feedwater Pump as a result of the coincident low water levels in both steam generators.

An assessment was performed considering both the safety consequences and implications of this event with the following results and conclusions:

There were no operational or safety consequences or implications attributed to the reactor trip because:

- The two reactor trip breakers opened as required.

- All control and shutdown rods inserted as designed.

- The spurious closure of one MSIV at full power is not explicitly addressed in the Ginna Updated Final Safety Analysis Report (UFSAR). The event is bounded by the loss of electrical load transient. The loss of electrical load transients are performed to evaluate reactor coolant system (RCS) over-heating events and their impact on the following design criteria:

  i) minimum DNBR,
  ii) maximum RCS pressure, and
  iii) maximum Main Steam and SG pressure

  The UFSAR transients were examined and compared to the plant response for the actual event. The plant behavior was found to be bounded by the events detailed in the accident analysis. The UFSAR transients were found to be bounding due to a combination of less limiting actual plant conditions and proper operation of plant equipment in responding to the plant trip.

17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

- The Conditional Core Damage Probability (CCDP) of the event was calculated as 1.730E-06.

Based on the above and the review of post-trip data and past plant transients, it can be concluded that the plant operated as designed and that the public's health and safety were assured at all times.

V. CORRECTIVE ACTIONS:

A. ACTION TAKEN TO RETURN AFFECTED SYSTEMS TO PRE-EVENT NORMAL STATUS:

- The solid plug in the 'B' MSIV was replaced with a drilled plug.

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

- Complete a comprehensive maintenance procedure upgrade project using a prioritized schedule based on single point vulnerabilities and other factors.

- Develop, issue, and train the craftsmen on a procedure defining work package walkdown requirements, including like-for-like comparisons.

- Revise the Vendor Technical Manual to include details of the installed drilled plug in the cylinder cap.

- Revise the maintenance procedure for the MSIV's to include details of the drilled plug and to include a peer check to insure that a drilled plug is installed.

- As part of the single point vulnerability mitigation strategy development, review and verify that configuration changes affecting single point vulnerability components are adequately reflected in design documents and vendor manuals.

- Provide training to improve the questioning attitude for Engineering personnel and reinforce the procedural requirements when a potential design issue is identified .

17. NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)*

VI. ADDITIONAL INFORMATION:

A. FAILED COMPONENTS:

Following the event, during component realignment, the motor driven fire pump breaker failed to close remotely.

B. PREVIOUS LERs ON SIMILAR EVENTS:

A similar Ginna LER event historical search was conducted which resulted in a determination that the drilled plug was initially installed as a result of early plant events. This was described in event 75-03, Spurious Closing of Main Steam Isolation Valves.

C. THE ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) COMPONENT FUNCTION IDENTIFIER AND SYSTEM NAME OF EACH COMPONENT OR SYSTEM REFERRED TO IN THIS LER:

COMPONENT	IEEE 803 FUNCTION NUMBER	IEEE 805 SYSTEM IDENTIFICATION
Valve, Isolation	ISV	SB